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ABSTRACT

Research suggests that many graduate students have negative attitudes toward research. However, studies in this area have primarily involved white populations, and little is known about the attitudes toward research of African American students, despite the fact that the latter tend to attain lower levels of achievement in research methodology courses than do their white counterparts (A. Onwuegbuzie, 1999). Consequently, this two-stage study examined the attitudes toward research of African American graduate students. The first stage of this study involved the development and score validation of the Attitudes toward Research Design Survey (ATRDS), using exploratory factor analysis. The psychometric properties of the ATRDS scale were assessed (i.e., structural validity, score reliability). The second stage of the investigation involved comparing subscale scores emerging from the ATRDS between African American students enrolled at an institution in an urban setting and those enrolled in a rural setting. These comparisons were made with regard to research self-efficacy, perceived professional utility of research, and learning preferences. With respect to the second phase of the investigation, findings revealed that African American graduate students enrolled at the urban institution reported statistically significantly higher levels of research self-efficacy. The Cohen's "d" effect size associated with this difference was moderate. Implications of this and other findings are discussed. (Contains 3 tables and 60 references.) (Author/SLD)

Running head: ATTITUDES TOWARD RESEARCH

Attitudes toward Research of African-American Graduate Students as a Function of Locality

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Abstract

Research suggests that many graduate students have negative attitudes toward research. However, studies in this area primarily have involved White populations. In particular, little is known about the attitudes toward research of African-American students, despite the fact the latter tend to attain lower levels of achievement in research methodology courses than do their White counterparts (Onwuegbuzie, 1999). Consequently, this two-stage study examined the attitudes toward research of African-American graduate students. The first stage of the study involved the development and score validation of the Attitudes Toward Research Design Survey (ATRDS), using exploratory factor analysis. In particular, the psychometric properties of the ATRDS scale were assessed (i.e., structural validity, score reliability). The second stage of the investigation involved comparing subscale scores emerging from the ATRDS between African-American students enrolled at an institution located in an urban setting and those enrolled in a rural setting. Specifically, these comparisons were made with regard to research self-efficacy, perceived professional utility of research, and learning preferences.

With respect to the second phase of the investigation, findings revealed that African-American graduate students enrolled at the urban institution reported statistically significantly higher levels of research self-efficacy. The Cohen's *d* effect sizes associated with this difference was moderate. Implications of this and other findings are discussed.

Attitudes toward Research of African-American Graduate Students

as a Function of Locality

In recent years, studies conducted on graduate students enrolled in research methodology and statistics classes have been the subject of doctoral dissertations (Beard, 1998; Campbell-Higgins, 2000; Faghihi, 1998; Felton, 1996), journal articles, and other publication outlets (Feldman & Martinez-Pons, 1995; Kahn, 2000; Onwuegbuzie, 2001; Phillips & Russell, 1994; Stajkovick & Sommer, 2000). Research in this area has found that most of these students are extremely frightened about taking such courses (Blalock, 1987; Caine, Centa, Doroff, Horowitz, & Wisenbaker, 1978; Gaydosh, 1990; Lundgren & Fawcett, 1980; Schacht & Stewart, 1990, 1991; Zeidner, 1991). These students deem educational research courses to be the most difficult in their programs of study, often revealing that they would not have enrolled in these classes if they had not been required to do so (Onwuegbuzie, DaRos, & Ryan, 1997). Moreover, research indicates that many students struggle in research methodology and statistics classes, culminating in underachievement and negative attitudes toward research (Onwuegbuzie, 1997). However, studies in this area primarily have involved Caucasian-American students. In particular, little is known about the experiences of African-American students, despite the fact that the latter tend to attain lower levels of achievement in research methodology courses than do their Caucasian-American counterparts (Onwuegbuzie, 1999)

In studying African-American students enrolled in research methodology and statistics courses, variables that have a cultural context appear to offer promise. These constructs include learning preferences, research self-efficacy, and perceived utility of research methods. To date, these variables have not necessarily been considered simultaneously. Yet, studying these variables within the same framework has the potential to broaden our picture of the characteristics and

experiences of African-American graduate students enrolled in research methodology courses.

Learning Preferences

Learning styles or learning preferences are defined as needs for conditions that effectuate learning. These preferences include a number of variables related to personality, culture, or physical surroundings (Sternberg & Williams, 2002). Dunn and Dunn (1987) examined the physical environment needs of learners. These areas included lighting, seating, location in the environment, noise, and temperature. Moreover, Dunn, Beaudry, and Klavas (1989) identified the following four dimensions to learning style: (a) Cognitive (i.e., information processing habits); (b) Affective (i.e., personality aspects); (c) Physiological (i.e., learning related behaviors); and (d) Psychological (i.e., inner strengths and individuality). These four dimensions are similar to Bandura's (1994) four sources of efficacy beliefs: performance or mastery, vicarious experiences, verbal or social persuasion, and physiological and/or emotional states.

Cultural background also is considered to be a factor in learning. Indeed, the approach that students take to learning tasks may be associated with the cultural norms of a specific group (Sternberg & Williams, 2002). Some students prefer to learn individually, whereas others prefer working within groups. Kolb (1985) created the Learning Style Inventory (LSI), a 12-item measure of individuals' preferred learning styles. This instrument identifies learning styles pertaining to four dimensions: diverging, assimilating, converging, and accommodating. These modalities combine preferences for experiencing, thinking, reflecting, and doing. The LSI has become a useful tool for self-assessment, for teachers to plan appropriate instructional strategies, and for a wide variety of professional groups. Willcoxson and Prosser (1996) examined the LSI2, a revision of the LSI, reporting scores that provided evidence of adequate psychometric properties. The LSI3 is the current edition of this instrument. Kolb (1985) promulgated a Cycle of

Learning and postulated that the learner must progress through the stages of experiencing, reflecting, conceptualizing, and planning. Kolb's Cycle of Learning may be applied to team learning, collaboration, or cooperative learning activities.

Gregorc (1982) developed the Gregorc Style Delineator (GSD), a self-report instrument, to assess cognitive learning styles. He identifies two sets of qualities: Concrete/Abstract and Sequential/Random. He then separated the two sets of qualities into the following four learning styles:

1. Concrete Sequential (CS), in which learners prefer direct, hands-on activities;
2. Abstract Random (AR), in which learners sense moods and use intuition in activities;
3. Abstract Sequential (AS), in which learners use written, verbal, and image symbols in activities;
4. Concrete Random (CR), in which learners use a trial-and-error approach to activities.

Gregorc (1984) contended that relationships exist among the individual's learning style, the materials used in teaching, and teaching strategies. Teachers can use the GSD to design lessons that will meet the needs of all learners. Likewise, Sternberg (1994) believed that successful teachers will vary both teaching and assessment methods to reach a variety of thinking and learning styles. Some students prefer to learn individually; some prefer working with groups. Some students learn best from auditory instruction, like lecture, whereas others require visual images and physical flexibility or mobility in their learning environments. A large number of variables may be considered when identifying learning preferences or learning styles, providing an opportunity to identify and teach to students' preferred modalities at all grade levels (Dunn,

Dunn, & Price, 1991).

Collaborative learning and cooperative learning represent types of learning styles that have a cultural context. The effects of these modes of learning on educational outcomes have been studied throughout all levels of education. At the public school level, a few studies have found cooperative learning or collaborative learning to have a negative effect on academic achievement. For example, Windschitl (1999) examined middle school participants on the variables of academic assertiveness within group projects. He defined academic assertiveness as the tendency of some participants to be more assertive verbally and physically during group interactions when expressing themselves. He found that individuals who were paired with assertive partners scored lower on the posttest, suggesting that academic assertiveness has an adverse effect on partners in collaborative groups. However, the majority of findings in this area have been positive. In fact, Slavin (1990) identified more than 70 high-quality studies that compared cooperative learning and traditional methods in elementary and secondary schools. Of the 70 studies, 67 measured effects on student achievement, with 41 (61%) reporting statistically significantly higher achievement levels in cooperative classes than in control classes. Twenty-five (37%) investigations reported no statistically significant differences, and in only one study did the control group outperform the experimental group. Further, Johnson and Johnson (1989) examined 375 experimental and correlational studies spanning 90 years with different age groups, in different subject areas, and in a variety of settings. He found that students in cooperative classrooms outperformed those in both competitive and individualistic classrooms by approximately two-thirds of a standard deviation.

The picture, at the college level however, is not as consistent. For instance, Bol, Warkentin, Nunnery, and O'Connell (1999) developed the Study Activity Questionnaire (SAQ) in an attempt to examine study habits among college students enrolled in an introductory research

methods or statistics course from a college of education. The authors found that self-directed study was significantly related to final exam scores, calling into question the assumption that collaborative/cooperative learning helps students to increase their levels of academic achievement.

Onwuegbuzie (2001) examined the relationship between peer orientation and achievement among students enrolled in a graduate-level research methodology course. This researcher administered the Productivity Environmental Preference Survey (PEPS), developed by Dunn et al. (1991), to assess learning preferences. Onwuegbuzie found that students who were oriented toward cooperative learning actually attained lower achievement levels than did those who were not so oriented. Onwuegbuzie concluded that the lower levels of achievement among peer-oriented students might be accounted for by debilitative learning styles. That is, peer-oriented learners may prefer cooperative activities in a research methods or statistics course because of low motivation, less responsibility, negative attitudes toward authority figures, lower inclination for learning with multiple resources, or a need for mobility in the learning environment. Onwuegbuzie described the behavior of some students in cooperative learning activities as representing "coat-tailing" because they expended less effort pursuing academic achievement.

In an earlier study, Courtney, Courtney, and Nicholson (1994) examined cooperative learning (CL) in graduate-level statistics courses. No statistically significant differences in academic achievement were found between the CL group and the traditional learning group; however, the CL students showed improved self-efficacy and reduced anxiety with regard to course content. In another investigation of cooperative learning in an introductory statistics course, Potthast (1999) documented that students engaging in cooperative learning attained higher test scores, but not all students viewed CL to be a valuable experience. Despite the general belief that CL, as a learning style, is a meaningful way to engage students in research methods and

statistics courses, research has yet to provide sufficient support for this hypothesis. Thus, additional research on CL is necessary to determine its utility in research methods and statistics courses.

Self-efficacy

Another area of interest in recent research projects is self-efficacy. Bandura (1994, 1986) describes self-efficacy as an individual's beliefs about his or her performance capability. Self-efficacy contributes to a person's thoughts, feelings, and motivation. Bandura (1994) identifies four processes: (a) Affective processes, which regulate emotional states and elicit emotional reactions or patterns of behavior; (b) Cognitive processes, which involve the acquisition of information, as well as its organization and use; (c) Motivation to action and levels of motivation, which are represented by choices in action and by intensity and persistency in effort; and (d) Self-regulation, which exercises influence over motivation, cognitive processes, and affective processes.

The degree of self-efficacy experienced by individuals varies with perceptions of their ability to complete difficulty tasks. An individual with high self-efficacy will be more interested in the challenges he or she faces and will become more deeply involved with task completion. Such an individual is more self-assured, more willing to bounce back from failures, and more willing to continue to address other challenging issues (Bandura, 1994). Having low self-efficacy produces low aspirations and weak commitment to difficult tasks. This individual will be more willing to give up than to preserve. He or she gives less effort, less commitment, and less performance, thereby exacerbating the causes of low self-efficacy (Bandura, 1994).

Dykeman (1994) examined self-efficacy and test anxiety among graduate students, determining that high self-efficacy students who received criterion-referenced feedback

experienced the lowest test anxiety levels. In another study with research anxiety as a variable, Szymanski, Swett, Watson, Lin, and Chan (1998) observed increases in perceived research ability and decreases in test anxiety due to contextualized instruction. Further, Onwuegbuzie (2000) examined self-perception and statistics anxiety, reporting that low self-perception individuals experience the highest levels of statistics anxiety. Also, Wilson and Onwuegbuzie (2001) noted increases in anxiety levels in testing situations among both master's and doctoral students who were involved in educational research courses.

Trimarco (1997) examined anxiety in research and statistics courses and found that lack of perceived statistical competence was responsible for increased fear of statistics. She supported the development of new instruments to measure self-efficacy that are administered prior to taking a statistics course. Hanson (1997) described two-self-efficacy measures developed in the 1980's to measure self-efficacy in counseling and psychology, namely, the Career Decision-Making Self-Efficacy Scale (Taylor & Betz, 1983) and the Mathematics Self-Efficacy Scale (Betz & Hackell, 1983). She further noted that an unpublished Research Self-Efficacy Scale was constructed by Greely et al. (1989) to predict interest of graduate students in research activities. Another measure of self-efficacy is the Task-Specific Occupational Self-Efficacy Scale, developed by Rooney and Osipow (1992).

Self-efficacy measures continue to be constructed and examined for score validity and reliability. Also, new research continues to examine related variables such as perceived professional utility of research. In his investigation of graduate students, Cassidy (2000) examined locus of control, academic achievement, learning style, and academic self-efficacy. In this study, Cassidy (2000) developed two versions of a measure named Research Methods Proficiency (RMP), a self-report questionnaire. The first version contained 38 items and was used with Level

I Module students, and the second version contained an additional 10 items appropriate to use with Level II Module students. Both versions employed a Likert-format scale, with a response of "1" representing "never heard of this" and "5" representing "very confident." The RMP was used as both a pretest and a posttest in the study. Both Level I Module and Level II Module students showed increases on the RMP. Evidence also has been provided by Larkin (2000) to support increased RMP following an educational intervention. Specifically, Larkin (2000) reported on a study on changing teacher attitudes toward research. The study was qualitative and resulted from a professional development experiment in which classroom teachers worked with college faculty to prepare educational candidates for elementary education. The discourse between the participants was an Inquiry Seminar and the researcher was a participant/observer who recorded her thoughts as ethnographic research in journals and rich descriptions. The project produced insights into teacher research or practitioner research as a means of professional growth.

Perceptions of the professional utility of research are changing as the No Child Left Behind Act of 2001 (U. S. Congress, 2001) is driving professional development. The emphasis in the legislation on research-based decision making concerning educational practice, assessment, materials, and professional development indicates that teachers need to develop their research self-efficacy, their flexibility in teaching styles to educate children and youth according to their learning preferences, and their perceptions of the utility of reading, conducting, and reflecting on research. Continued research into the value and necessity of educational research methods and statistics courses is required. In particular, more research in these areas is needed among minority populations. Thus, the purpose of the present study was to examine research self-efficacy, perceived professional utility of research, and learning preferences among African-American graduate students as a function of locality. That is, African-American graduate students enrolled

at an institution located in an urban setting and those enrolled in a rural setting were compared with respect to these variables. It was hoped that this study would contribute to the literature by making within-race comparisons.

Method

Participants

The sample comprised 79 African-American graduate students attending either at an institution located in an urban setting ($n = 45$) and those enrolled in a rural setting ($n = 34$). Participants from both settings were enrolled in a quantitative-based research methodology course. The majority of students was female (82.28%). Ages of the sample members ranged from 22 to 62 years ($M = 29.41$, $SD = 7.33$).

Instruments and Procedures

All participants were administered the Attitudes toward Research Design (ATRD) survey. This instrument was developed specifically for the present investigation. The ATRD instrument contains four components. The first component elicits demographic information (e.g., gender, age, race). The other three components contain a total of sixty-one 5-point Likert-format items, anchored by "1" = strongly agree and "5" = strongly disagree. These components measure research self-efficacy, perceived professional utility of research, and learning preferences. One component contains 25 items that measure research self-efficacy (Cronbach's alpha ["] = .85; 95% confidence interval [CI] = .80, .89), another component consists of 9 items measuring perceived professional utility of research (" = .67; 95% CI = .55, .77), and the remaining component containing 27 items measuring aspects of learning preferences (" = .53; 95% CI = .37, .67).

Results

Inter-item correlation matrices were used to conduct three principal component analyses with orthogonal rotations (Kieffer, 1999). Specifically, the principal component analyses were conducted on (a) the 25 research self-efficacy items, (b) the 9 perceived professional utility of research items, and (c) the 27 learning preference items. The results of each of these exploratory factor analyses are described below.

Factor Analysis 1: Research Self-Efficacy

The initial factor analysis of the 25 research self-efficacy items yielded 9 factors using the eigenvalue-greater-than-one rule, also known as K1 (Kaiser, 1958). The scree plot (Cattell, 1966; Zwick & Velicer, 1986) suggested a four-factor solution. Because the K1 rule has been found typically to overestimate the number of factors (Zwick & Velicer, 1986), the four-factor solution was used. An exploratory factor analysis was then conducted that extracted four factors with orthogonal rotation. The four-factor solution explained 51.63% of the total variance in the correlation matrix. Using a cut-off point of |.50|, as recommended by (Hair, Anderson, Tatham, & Black, 1995), five items failed to load on any factor. Therefore, these five items were removed, reducing the total number of research self-efficacy items to 20.

After removing these five items, a principal components analysis was undertaken. On this occasion, the scree plot suggested a two-factor solution. Therefore, an orthogonal rotation was conducted. The two-factor solution explained 47.03% of the total variance in the correlation matrix. Using the |.50| criterion, two items failed to load on any factor. Therefore, these two items were removed, reducing the total number of research self-efficacy items to 18. After removing these two items, another principal components analysis was undertaken. Again, the scree plot suggested a two-factor solution. Therefore, an orthogonal rotation was conducted. Using the |.50| criterion, all items loaded on only one factor. A principal components analysis with an oblique

(i.e., promax) rotation also was conducted on the 18-item correlation matrix (Henson, 2002; Pedhazur & Schmelkin, 1991). This led to no changes in the structure. An examination of the *trace* (i.e., the proportion of variance explained, or eigenvalue, after rotation; Hetzel, 1996) revealed that these two factors explained 50.04% of the total variance. This percentage was between 45% (Henson, Capraro, & Capraro, in press) and 52% (Henson & Roberts, in press), which represents the average proportion of variation explained by extracted factors in educational and psychological research studies, respectively. The score reliability pertaining to the 18-item research self-efficacy scale was .87 (95% CI = .82, .91). Factor 1 (" = .80; 95% CI = .73, .86), containing 8 items that explained 34.54% of the variance, was labeled Perceived Research Understanding and Competence. Factor 2 (" = .90; 95% CI = .86, .93), containing 10 items that explained an additional 15.50% of the variance, was labeled Perceived Research Preparedness and Organizational Skills. Table 1 presents the factor pattern/structure coefficients for the obtained solution for the 18 research self-efficacy items.

Insert Table 1 about here

These two sets of factor scores were then used to compare the two sample groups. After applying the Bonferroni adjustment, the *t*-tests revealed that African-American graduate students attending the urban institution ($M = 29.47$, $SD = 4.89$) reported statistically significantly ($t = 3.30$, $p < .05$) higher levels of perceived research understanding and competence than did those attending the rural institution ($M = 25.50$, $SD = 5.79$). The associated effect size of 0.75 was large (Cohen, 1988). However, no statistically significant difference ($t = 0.16$, $p > .05$) emerged between urban students ($M = 42.80$, $SD = 7.92$) and rural students ($M = 42.56$, $SD = 4.00$).

Conversely, using the total scores as an overall measure of research self-efficacy, the urban students ($M = 72.27$, $SD = 10.84$) reported statistically significantly ($t = 2.02$, $p < .05$) higher levels of perceived research understanding and competence than rural students ($M = 68.06$, $SD = 7.63$), with a moderate corresponding effect size (0.44).

Factor Analysis 2: Perceived Professional Utility of Research

The initial factor analysis of the nine perceived professional utility items yielded two factors using the eigenvalue-greater-than-one rule, as did the scree plot. Thus, the two-factor solution was used. An exploratory factor analysis was then conducted that extracted two factors with orthogonal rotation. The two-factor solution explained 53.92% of the total variance in the correlation matrix. Using a cut-off point of |.50|, one item failed to load on any factor. Therefore, this item was removed, reducing the total number of perceived professional utility of research items to 8. However, removal of this item, reduced the number of items that loaded on the second factor to two, which was too small to yield reliable scores. Therefore, the two items from the second factor were removed on the grounds that they did not represent a meaningful and trustworthy solution.

After removing these three items, a principal components analysis was undertaken. On this occasion, both the K1 and the scree plot suggested a one-factor solution. The one-factor solution explained 34.23% of the total variance in the correlation matrix. Using the |.50| criterion, one item failed to load on this factor. Therefore, this item was removed, reducing the total number of perceived professional utility of research items to 5.

After removing this item, another principal components analysis was undertaken. Again, both the KI and scree plot suggested a one-factor solution. Using the |.50| criterion, all five items loaded on this factor. An examination of the *trace* revealed that this factor explained 53.41% of

the total variance. This percentage was between the normal range of 45% to 52% normally found in exploratory factor analyses (Henson, Capraro, & Capraro, in press; Henson & Roberts, in press). The score reliability pertaining to the 5-item measure of perceived professional utility of research was .78 (95% CI = .38, .97), representing an increase of 16.42% in score reliability from the original 9-item scale. Table 2 presents the factor pattern/structure coefficients for the obtained solution for the 5 perceived professional utility of research items. This factor score was then used to compare the two African-American groups. The independent *t*-test revealed no statistically significant difference ($t = 1.14$, $p > .05$) between urban students ($M = 21.60$, $SD = 4.00$) and rural students ($M = 20.79$, $SD = 2.19$).

Insert Table 2 about here

Factor Analysis 3: Learning Preferences

The initial factor analysis of the 27 learning preference items yielded 9 factors using the eigenvalue-greater-than-one rule. However, the scree plot suggested a four-factor solution. Thus, the latter solution was employed. An exploratory factor analysis was then conducted that extracted four factors with orthogonal rotation. The four-factor solution explained 41.73% of the total variance in the correlation matrix. However, using a cut-off point of |.50|, 18 items failed to load on any factor. This explained, at least in part, why the score reliability for this scale, cited above, was low. Therefore, these 18 items were removed, reducing the total number of learning preference items to 9.

After removing these 18 items, a principal components analysis was undertaken. On this occasion, the scree plot suggested a two-factor solution. Therefore, an orthogonal rotation was

conducted. The two-factor solution explained 55.92% of the total variance in the correlation matrix. Using the |.50| criterion, one item failed to load on any factor. Therefore, this item was removed, reducing the total number of learning preference items to 7.

After removing this item, another principal components analysis was undertaken. On this occasion, the scree plot suggested a one-factor solution. Using the |.50| criterion, all items loaded on this factor. An examination of the *trace* revealed that this factor explained 37.41% of the total variance. This percentage was smaller than the 45% to 52% proportion of variance explained that is typically found (Henson et al., in press; Henson & Roberts, in press). The score reliability pertaining to the 8-item learning preference scale was .76 (95% CI = .67, .83), representing an Table 3 presents the factor pattern/structure coefficients for the obtained solution for the 8 learning preference items.

Insert Table 3 about here

The learning preference factor scores were then used to compare the two African-American samples. The independent *t*-test revealed no statistically significant difference ($t = 0.25$, $p > .05$) in perceived professional utility between urban students ($M = 28.22$, $SD = 4.90$) and rural students ($M = 27.97$, $SD = 3.56$). Thus, the urban and rural African-American students were similar with respect to learning preferences.

Discussion

The purpose of the present study was twofold. The first purpose involved the development and score validation of the Attitudes toward Research Design Survey (ATRDS), using exploratory factor analysis. In particular, the psychometric properties of the ATRDS scale

were assessed (i.e., structural validity, score reliability). The second purpose was to compare subscale scores emerging from the ATRDS between African-American students enrolled at an institution located in an urban setting and those enrolled in a rural setting. Specifically, these comparisons were made with regard to research self-efficacy, perceived professional utility of research, and learning preferences.

The series of exploratory factor analyses indicates that the ATRDS offers promise as a tool for studying the attitudes and characteristics of African-American students. Two of the three scales contained in the ATRDS, namely, the Research Self-Efficacy Scale and Perceived the Professional Utility of Research Scale, appeared to possess adequate initial psychometric properties. The Research Self-Efficacy Scale was found to yield two subscales: (a) Perceived Research Understanding and Competence and (b) Perceived Research Preparedness and Organizational Skills. Both of these scales yielded score reliability coefficients that were in the .80s and .90s, which are high for measures of affect (Nunally & Bernstein, 1994).

Although the Perceived Research Preparedness and Organizational Skills subscale scores did not discriminate urban African-American graduate students from rural African-American graduate students, locality differences were found with respect to Perceived Research Understanding and Competence subscale scores. Specifically, compared to their rural counterparts, the urban students reported moderately higher levels of self-efficacy pertaining to how much they understand research and how competent they deem themselves to be. Also, the urban sample reported moderately higher overall research self-efficacy levels than did their rural peers. Why these rural students reported lower levels of research self-efficacy should be the subject of future investigations.

The next step in the development of the Research Self-Efficacy Scale is to administer it to

a larger sample of African-American graduate students and then conduct a confirmatory factor analysis to test the two-factor structure of this scale found in the present study. The dimensionality of this scale also should be assessed on other populations such as Caucasian-American and Hispanic graduate students. Future research should consider using the 18-item Research Self-Efficacy Scale component of the ATRDS, or any future revised version, to compare African-American graduate students to Caucasian-American graduate students and to other minority groups. Also, researchers should assess whether research self-efficacy predicts performance in research methodology courses.

The Professional Utility of Research Scale was found to be unidimensional, yielding an adequate score reliability coefficient. Interestingly, scores for these scales did not discriminate the rural and urban study participants. That is, both subgroups were similar with respect to how useful they found research for their professional careers. Again, future confirmatory factor analysis and other validation techniques are needed to assess further the psychometric properties of this scale.

Finally, the Learning Preference Scale clearly needs more work. Although the score reliability coefficient was adequate, the low proportion of variance explained by the eight items included in the final solution (i.e., 37.41%) suggests that more items are needed. Indeed, the Spearman-Brown prophecy (Crocker & Algina, 1986) predicts that doubling the number of items on the Learning Preference Scale from 8 to 16, could increase score reliability from .76 to .86. This would represent a 13.2% increase in score reliability. Although no difference was found learning preference scores between the urban and rural African-American graduate students, replications are needed to assess the reliability of this finding.

The present study has made a contribution to the literature by studying a graduate

population enrolled in research methodology courses who have been found to experience lower levels of achievement in these courses relative to their peers (Onwuegbuzie, 1999). Moreover, an instrument containing several scales (i.e., ATRDS) was developed that appears to be a useful tool. The major finding in this study is that research self-efficacy has a regional context. This suggests that there might be as much or even more within-race variations as there are between-race variations in research methodology courses.

References

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior, 4* (pp. 71-81). New York: Academic Press.

Beard, T. L. (1998). The relationship of writing self-efficacy and retention variable to the academic progress of African-American students with learning disabilities in higher education. *Dissertation Abstracts International Section A: Humanities & Social Sciences, 59*(5-A), 1519. US: University Microfilms International.

Betz, N. E., & Hackell, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational Behavior, 23*, 329-345.

Blalock, H. M. (1987). Some general goals in teaching statistics. *Teaching Sociology, 15*, 164-172.

Bol, L., Warkentin, R. W., Nunnery, J. A., & O'Connell, A. A. (1999). College students' study activities and their relationship to study context, reference course, and achievement. *College Student Journal, 33*, 608-624.

Caine, R. D., Centa, D., Doroff, C., Horowitz, J. H., & Wisenbaker, V. (1978). Statistics from who? *Teaching Sociology, 6*, 37-46.

Campbell-Higgins, R. C. S. (2000). The educative process as a contributor to self-efficacy in adult education graduate students. *Dissertation Abstracts International Section A: Humanities & Social Sciences, 61*(6-A), 2142. US: University Microfilms International.

Cassidy, S. (2000). Learning style, academic belief systems, self-report student proficiency and academic achievement in higher education. *Educational Psychology, 20*, 307-324.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245-276.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, N.J.: Lawrence Erlbaum.

Courtney, D. P., Courtney, M., & Nicholson, C. (1994). The effect of cooperative learning as an instructional practice at the college level. *College Student Journal, 28*, 417-477.

Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory.* Orlando, FL: Holt, Rinehart, and Winston.

Dunn, R., Beaudry, J., & Klavas, A. (1989). Survey of research on learning styles. *Educational Leadership, 46*, 50-58.

Dunn, R., & Dunn, K. (1987). *Understanding learning styles and the need for individual diagnosis and prescription.* Columbia, CT: The Learner's Dimension.

Dunn, R., Dunn, K., & Price, G. (1991). *Productivity Environmental Preference Survey.* Lawrence, KS: Price Systems, Inc.

Dykeman, B. F. (1994). The effects of motivational orientation, self-efficacy, and feedback condition on test anxiety. *Journal of Instructional Psychology, 21*, 114-120.

Faghihi, F. Y. (1998). A study of factors related to dissertation progress among doctoral Candidates: Focus on student research self-efficacy as a result of their research Training and experiences. *Dissertation Abstracts International Section A:*

Humanities & Social Sciences, 59(5-A), 1456. US: University Microfilms International.

Feldman, S., & Martinez-Pons, M. (1995, October). *Multiple role conflict and graduate students' academic performance*. Paper presented at the annual meeting of the New England Psychological Association. Wenham, MA. (ERIC Document Reproduction Service ED 390309)

Felton, E. S. (1996). Social support, self-efficacy, and sense of coherence in African-American, Asian, and White college students. *Dissertation Abstracts International Section A: Humanities & Social Sciences, 57*(4-A). US: University Microfilms International.

Gaydosh, L. R. (1990). *Syllabi and instructional materials for social statistics.* Washington, DC: American Sociological Association.

Greely, A. T., Johnson, E., Seem, S., Braner, M., Dias, L., Evans, K., Kincade, E., & Pricken, P. (1989). *Research Self-Efficacy Scale*. Unpublished scale presented at the Association for Women in Psychology Conference, Bethesda, MD.

Gregorc, A. F. (1982). *Gregorc Style Delineator: Developmental, technical, and administrative manual*. Columbia, CT: Gregorc Associates, Inc.

Gregorc, A. F. (1984). *The Gregorc Style Delineator: Developmental, technical, and administrative manual* (Rev. ed.). Columbia, CT: Gregorc Associates, Inc.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Hanson, J. C. (1997). The measurement of self-efficacy. *Measurement & Evaluation in Counseling & Development, 30*, 2-4.

Henson, R. K. (2002). From adolescent angst to adulthood: Substantive implications and measurement dilemmas in the development of teacher efficacy research. *Educational Psychologist, 37*, 137-150.

Hetzel, R. D. (1996). A primer on factor analysis with comments on patterns of practice and reporting. In B. Thompson (Ed.), *Advances in social science methodology* (Vol 4, pp. 175-206). Greenwich, CT: JAI Press.

Johnson, D. W., & Johnson, R. T. (1989). *Cooperation and competition: Theory and research.* Edina, MN: Interaction Book Co.

Kahn, J. H. (2000, August). *Research training environment changes: Impacts on research self-efficacy and interest.* Paper presented at the American Psychological Association, Washington, D.C. (ERIC Document Reproduction Service ED 446306)

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psyhcometrika, 23*, 187-200.

Kieffer, K. M. (1999). An introductory primer on the appropriate use of exploratory and confirmatory factor analysis. *Research in the Schools, 6*, 75-92.

Kolb, D. (1985). *Learning style inventory.* Boston: McBer & Co.

Larkin, E. (2000). Teacher research: An ethnography of changing practice. *Teaching & Change, 7*, 347-366.

Lundgren, T. D., & Fawcett, R. (1980). Statistics from statisticians. *Teaching Sociology, 7*, 191-201.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Onwuegbuzie, A.J. (1997). Writing a research proposal: The role of library anxiety,

statistics anxiety, and composition anxiety. *Library and Information Science Research, 19*, 5-33.

Onwuegbuzie, A. J. (1999). Underachievement of African-American graduate students in research methodology classes: Possible implications for the supply of school administrators. *The Journal of Negro Education, 67*, 67-78.

Onwuegbuzie, A. J. (2000). Self-perception: Academic achievement: Canonical correlation. *Journal of Educational Research, 93*, 323-331.

Onwuegbuzie, A. J. (2001). Relationship between peer orientation and achievement in cooperative learning-based research. *Journal of Educational Research, 94*, 164-172.

Onwuegbuzie, A. J., DaRos, D. A., & Ryan, J. (1997). The components of statistics anxiety: A phenomenological study. *Focus on Learning Problems in Mathematics, 19*, 11-35.

Pedhazur, E., & Schmelkin, L. (1991). *Measurement, design, and analysis*. Hillsdale, NJ: Lawrence Erlbaum.

Phillips, J. C., & Russell, R. K. (1994). Research self-efficacy, the research training environment, and research productivity among graduate students in counseling psychology. *Counseling Psychologist, 22*, 628-641.

Potthast, M. J. (1999). Outcomes of using small-group cooperative learning experiences in introductory statistics courses. *College Student Journal, 33*, 34-43.

Rooney, R. A., & Osipow, S. H. (1992). Task-Specific Occupational Self-Efficacy Scale: The development and validation of a prototype. *Journal of Vocational Behavior, 40*, 14-32.

Schacht, S., & Stewart, B. J. (1990). What's funny about statistics? A technique for reducing student anxiety. *Teaching Sociology*, 18, 52-56.

Schacht, S., & Stewart, B. J. (1991). What's funny about statistics? Interactive/user-friendly gimmicks for teaching statistics. *Teaching Sociology, 20*, 329-332.

Slavin, R. E. (1990). Cooperative learning: Theory, research, and practice. Englewood Cliffs, NJ: Prentice-Hall.

Stajkovic, A. D., & Sommer, S. M. (2000). Self-efficacy and causal attributions: Direct and reciprocal links. *Journal of Applied Social Psychology, 30*, 707-736.

Sternberg, R. J. (1994). Allowing for thinking styles. *Educational Leadership, 52*(3), 36-40.

Sternberg, R. J., & Williams, W. M. (2002). *Educational Psychology*. Boston, MA: Allyn & Bacon.

Szymanski, E. M., Swett, E. A., Watson, E. A., Lin, S., & Chan, S. 1998. The effects of contextualized research instruction on research anxiety, perceived utility of research, and confidence in research ability. *Rehabilitation Education, 112*, 347-360.

Taylor, K. M., & Betz, N. E. (1983). Applications of self-efficacy theory to an understanding and treatment of career indecision. *Journal of Vocational Behavior, 22*, 63-81.

Trimarco, K. A. (1997, October). *The effects of a graduate learning experience on anxiety, achievement and expectations in research and statistics*. Paper presented at the 28th annual meeting of the Northeastern Educational Research Association, Ellenville, New York. (ERIC Document Reproduction Service ED 419022)

U. S. Congress, P. L. 107-110. *No Child Left Behind Act of 2001*, H.R. 1. Reauthorization of the Elementary and Secondary Education Act.

Willcoxson, L., & Prosser, M. (1996). Kolb's learning style inventory (1985): Review and further study of validity and reliability. *British Journal of Educational Psychology, 66*, 251-261.

Wilson, V. A., & Onwuegbuzie, A. J. (2001, November). *Increasing and decreasing anxiety: A study of doctoral students in education research courses.* Paper presented at the annual meeting of the Mid-South Educational Research Association, Little Rock, AR.

Windschitl, M. (1999). *Influence of assertive partners in group learning activities.* Research Bulletin: Phi Delta Kappa Center for Evaluation, Development, and Research, September, 1999, No. 24.

Zeidner, M. (1991). Statistics and mathematics anxiety in social science students - some interesting parallels. *British Journal of Educational Psychology, 61*, 319-328.

Zwick, W. R., & Velicer, W. F. (1986). Factors influencing five rules for determining the number of components to retain. *Psychological Bulletin, 99*, 432-442.

Table 1: *Factor Pattern/Structure Coefficients from Principal Components Analysis of the Research Self-Efficacy Scale With Varimax Rotation*

	Factor Loading[1]		
Item	1 (Perceived Research Understanding and Competence)	2 (Perceived Research Preparedness/ Organizational Skills)	Communality Coefficient
35. I am willing to engage in new and unfamiliar tasks.	**.805**	-.175	.679
24. I am able to follow directions.	**.799**	-.253	.702
32. I can use e-mail efficiently.	**.795**	-.137	.651
33. I am computer illiterate.	**.741**	-.245	.609
25. I make good notes.	**.721**	-.220	.568
31. I feel free to contact my instructor for advice.	**.681**	-.041	.465
34. I am academically prepared to complete a research project.	**.672**	-.227	.503
26. I keep up with all assignments.	**.658**	-.359	.562
2. I know the purpose for taking a course in educational research.	**.593**	.429	.536
28. I have all the materials and supplies that I need to complete a project.	**.568**	-.350	.445
27. I plan how I will use my time.	**.524**	-.288	.358
5. I am not good at researching.	.364	**.617**	.513
53. I am easily confused by the patterns/processes of the different research designs.	.278	**.591**	.427
6. I am a poor writer.	.460	**.560**	.525
52. I am unfamiliar with much of the language associated with educational research.	.432	**.553**	.492
4. I have anxiety about my success in an educational research course.	.160	**.522**	.298
1. I understand the nature of educational research.	.369	**.442**	.332
51. I find educational research textbook difficult to read.	.405	**.426**	.346
Trace	6.22	2.79	9.01
% of variance explained	34.54	15.50	50.04

[1] Coefficients in bold represent loadings with significant effect sizes within each factor.

Table 2: *Factor Pattern/Structure Coefficients from Principal Components Analysis of the Perceived Professional Utility of Research With Varimax Rotation*

Item	Factor Loading[1]	Communality Coefficient
36. I expect to increase my expertise in research.	**.867**	.752
38. I will never use any of the things I learned in educational research.	**.804**	.646
37. I can use my experiences with computer databases in other situations/classes.	**.707**	.500
40. I spend no time on professional development other than what is required by my district.	**.677**	458
3. I will be able to use the information gained from educational research in my career.	**.560**	.314
Trace	2.67	2.67
% of variance explained	53.41	53.41

[1] Coefficients in bold represent loadings with significant effect sizes within each factor.

Table 3: *Factor Pattern/Structure Coefficients from Principal Components Analysis of the Learning Preferences With Varimax Rotation*

Item	Factor Loading[1]	Communality Coefficient
30. I expect to be graded fairly.	**.715**	.511
46. I never hear anything in a lecture that I feel I need to record.	**.668**	.446
9. I expect to spend lots of time researching my project.	**.653**	.426
20. I spend more than two hours preparing for classes.	**.622**	.387
50. Application in educational research activities helps me to deal with new material effectively.	**.597**	.356
45. I have an orderly system for taking/making notes on materials presented in research class.	**.550**	.303
21. I always read assigned material before coming to class.	**.541**	.293
47. I can remember all the material effectively from listening.	**.522**	.272
Trace	2.99	2.99
% of variance explained	37.41	37.41

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